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BI Accelerator:
Case Study of Retail Industry
NYOUG Annual Day 2008

Forrest Snowden and Shyam Varan Nath
Deloitte Consulting LLP
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Audit • Tax • Consulting • Financial Advisory.



Agenda for Today

Forrest Snowden (Overview of RBIA)

Speaker One

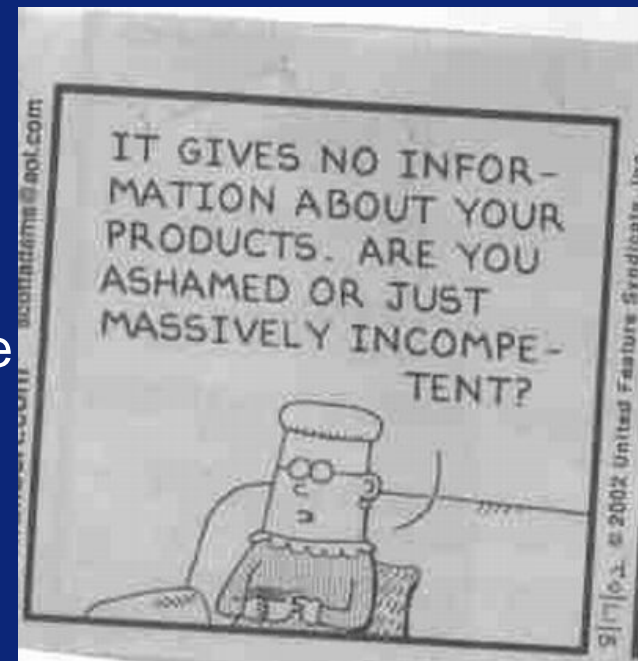
Shyam Varan Nath (Technical Details of RBIA)

Speaker Two



Trends in the Retail Sector

- We are beginning to see emergence of the next generation of retail analytic solutions for areas such as merchandising, pricing, ...
- We are on the cusp of a wave of Multi-channel retail transformation efforts
- Transformation will be big, intrusive and invasive to the current operations of large retailers
- On-Line retailers may begin to recognize the benefit of select physical locations



Key Business Issues

Key issues:

- How should retailers improve pricing, promotion and merchandising practices with the help of technology?
- How can retailers leverage business intelligence and analytics to grow their businesses?
- Remain competitive

Answers: Retail BI Accelerators

- Leverage pre-built software known as an accelerator
- As an example, harness the power of a market ready retail BI Accelerator that's integrates with your DB and BI tools

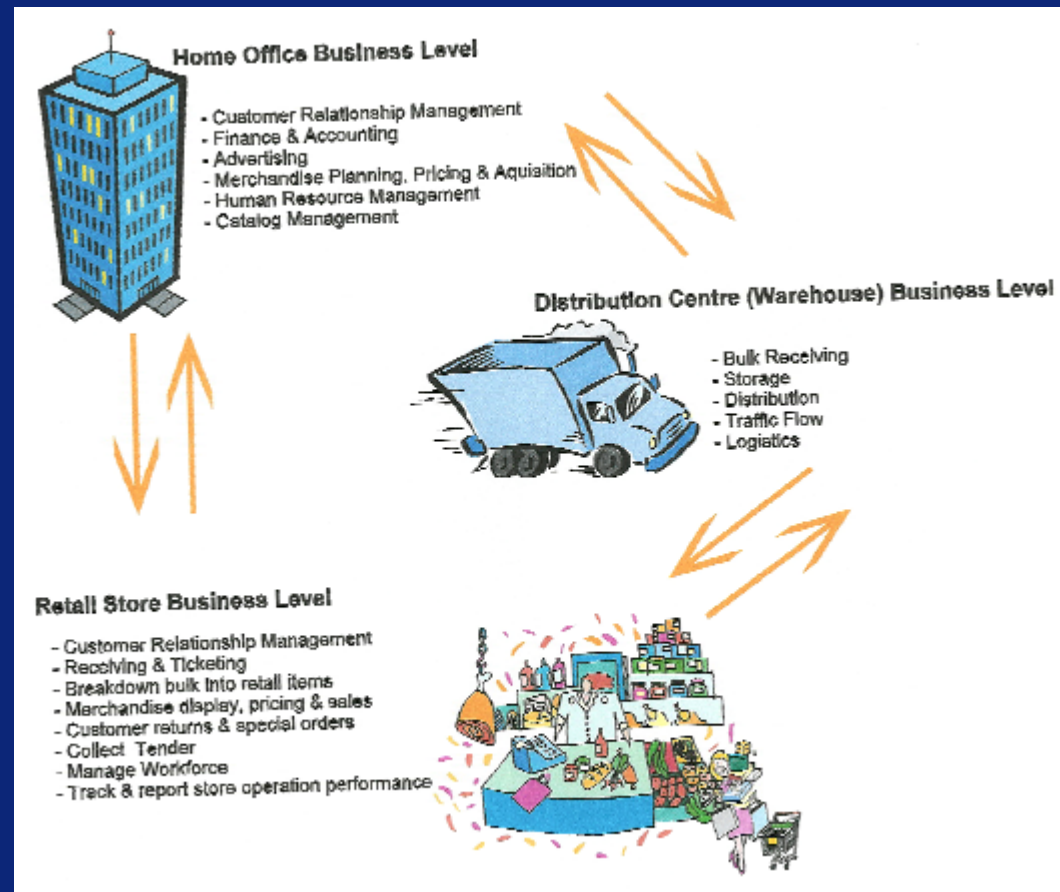


The Value of Retail Accelerators

- **Rapid ROI.** With its low cost of entry, fast implementation, measurable impact on costs and productivity
- **Pre-built.** Start with pre-built BI reports and dashboards incorporating the industry leading practices on top of Industry Standard Reference Data model (ARTS)
- **Oracle Products.** Oracle components like OWB, Oracle Data Warehouse, OLAP, Data Mining and OBIEE in combination with Retail Industry

Reference Data Model - ARTS

- Association for Retail technology Standards provides ARTS - the standard based data model for retail industry
 - Not restricted to DW alone. Can be used for SOA, ODS or other data integration effort
 - Relevant (up-to-date) for retailers needs
 - Repository driven
- ARTS data model applies to different segments of retail industry



ARTS Retail Subject Area Composition

- The ARTS Retail Data Model currently supports following business areas
 - Merchandise flow management
 - Inventory management
 - Item and price maintenance
 - Point of sale processing
 - Tender control
 - Store administration
 - Customer relationship management
 - Sales and productivity reporting
 - Ordering (partially supported)
 - Workforce Management (partially supported)

Retail Store Level - Store Operation

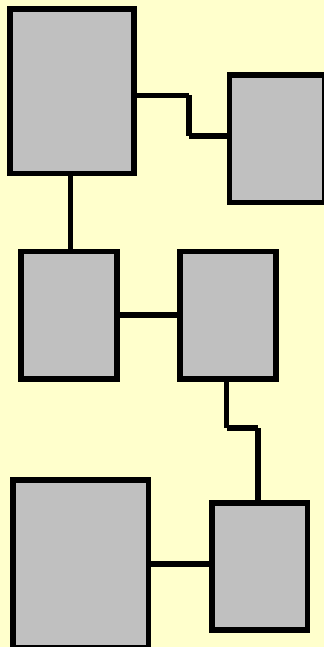
- **Customer Relationship Management** – The identification of the customer and their preferences, with the provision of gift registry loyalty awards schemes etc.
- **Receiving & Ticketing** – The receiving of goods from distribution centers and suppliers and the booking it into in-store inventory. The newly received stock is priced and labeled as required.
- **Breakdown Bulk into Retail Items** – Separation of bulk items (e.g. cartons) into single units rendering them ready for sale
- **Merchandise display, pricing & sales** – The display of store merchandise on shelves, together with their allocated prices and the tracking of the sales to customers
- **Collect Tender** – The electronic authorization of checks, credit & debit cards, as well as the validation of gift certificates and loyalty award points in payment of goods being sold.
- **Manage workforce** – The scheduling of staff as well as the monitoring of their performance
- **Track & report store operation performance** – The tracking and reporting of various financial and operational performances for each individual store.

RBIA Architecture

Oracle Data Warehouse for Retail Components

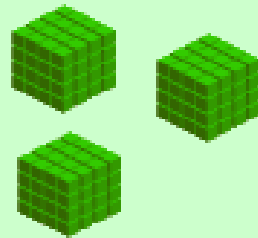
Base Layer

Enterprise DW in 3rd Normal Form:
• Logical model
• Physical model



Analytic Layer

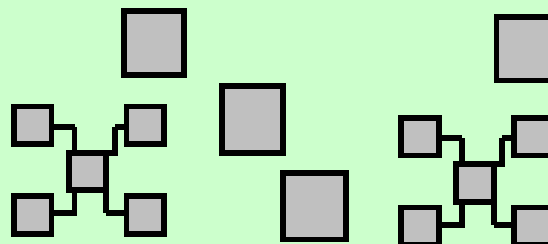
Analytic Workspace and Cubes



Advanced Analytics

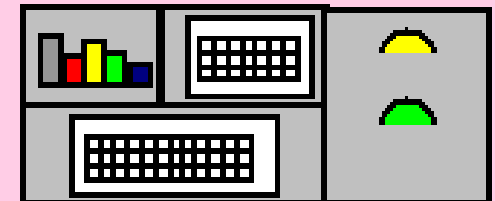
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Star Schemes, Summary Tables, Materialized Views

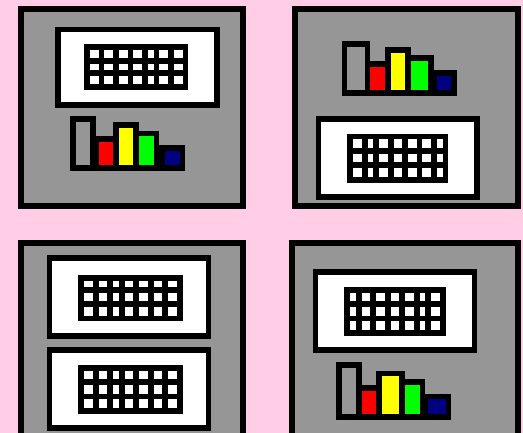


Reporting Layer

Oracle BI EE Dashboard



Sample Pre-built Reports



The Product Includes:

Industry Specific DW DW Data Model

- ✓ Industry Standard (ARTS) Compliant
- ✓ 3rd Normal Form -LDM, PDM
- ✓ Dimensional (STAR & OLAP)

Oracle Tech Stack

- ✓ Database 10GR2 EE With Options: Partitions, OLAP, Data Mining
- ✓ Oracle Designer
- ✓ OBI EE

Industry Specific DW Content

- ✓ Pre-built DW with 650+ Tables and 10500+ attributes
- ✓ Pre-built OLAP Cubes (15+)
- ✓ Pre-built Data Mining Models (10+)
- ✓ Pre-built Reports (320+) with Role based Dashboards
- ✓ Intra ETL using OWB
- ✓ Leveraging 10gR2 DW features including Statistics & Advanced SQL

Database EE 10g.R2 Platform

Role-Based Dashboard

Retail BI Warehouse Data Model

Oracle
Database
10g
(Enterprise
Edition)

OLAP

Data Mining

Partitioning

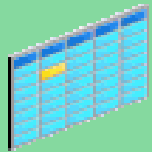
RAC

Spatial

Technology Layers

- Layered BIDW stack to use the advanced analytics

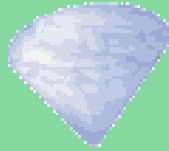
Business Intelligence Accelerators



Measures



Analytics

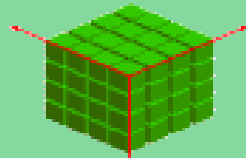


Predictive

Analytic Packages



Relational



OLAP



Mining

Derived and Aggregate Layer



3rd Normal Form Base Layer

Oracle 10g DB

Data Warehousing



ETL



OLAP

Statistics



Data Mining

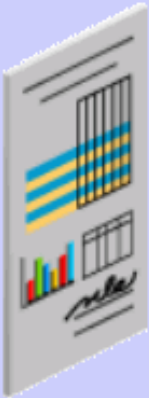
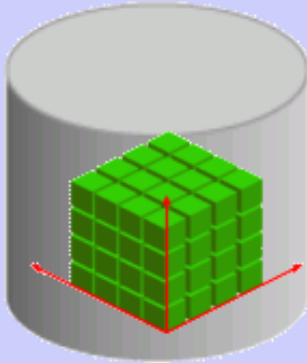
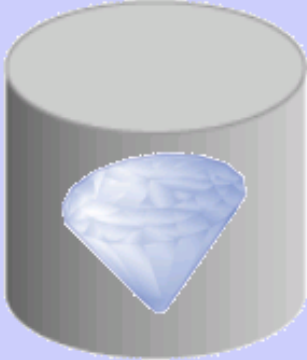


Why Multiple Analytics Tools?

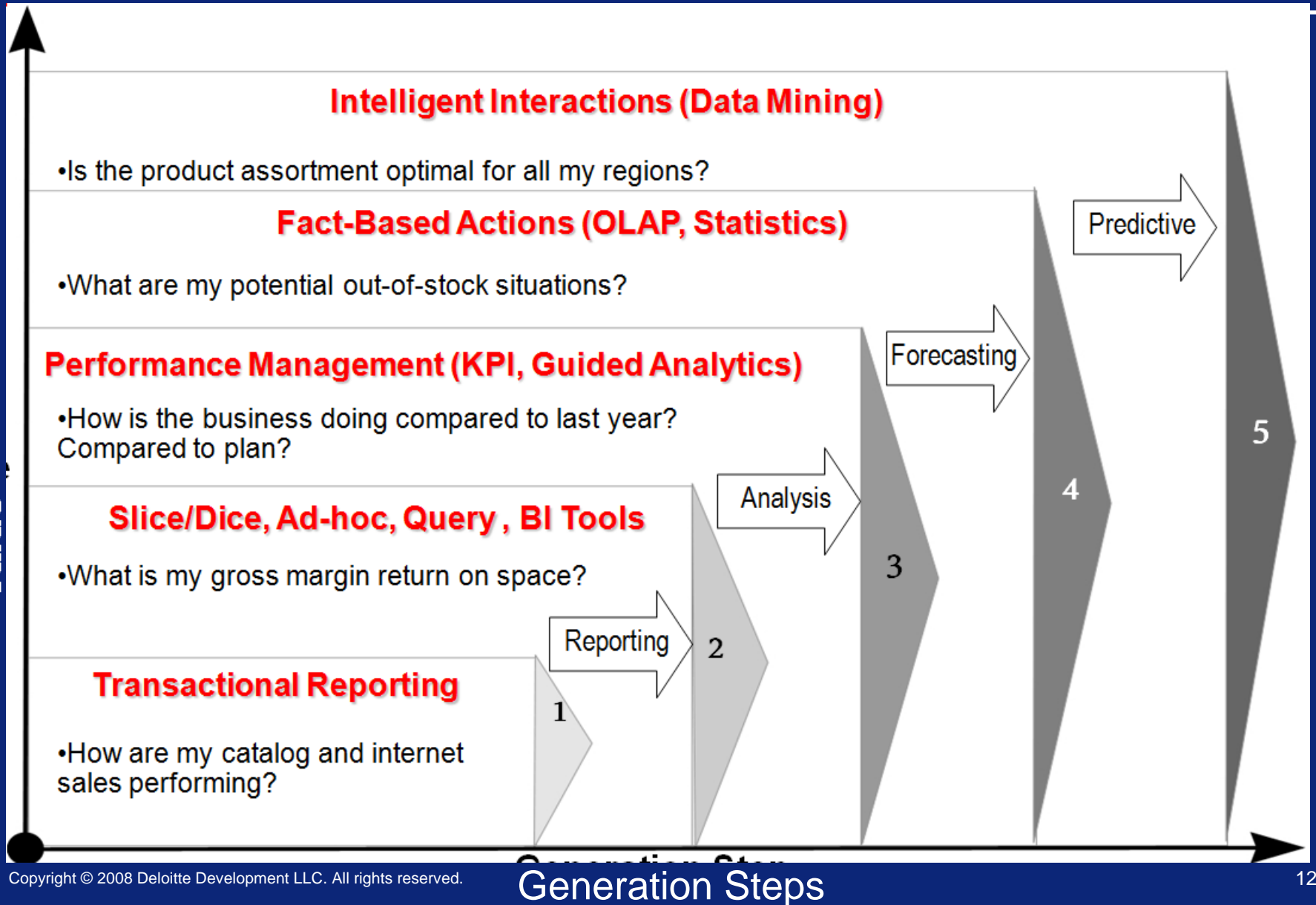
- Solving different analytics problems using each tool

Support for Query/Reporting, OLAP, and Data Mining

ODWR provides the infrastructure to rapidly set up a business intelligence solution involving query and reporting, OLAP, and data mining.

Query and Reporting	OLAP	Data Mining
		
Extraction of detailed and summary data	Summaries, trends, and forecasts	Knowledge discovery of hidden patterns and insights
"Information"	"Analysis"	"Insight and Prediction"
Who purchased insulin pumps in the last 3 years?	What is the average income of insulin pump buyers by region by year?	Who will buy an insulin pump in the next 6 months and why?

Value v/s Generation Steps in Analytics



Reference Data Model in RBIA

Items & SKU's

- ✓ Service, Prepared, Construction, Collection
- ✓ Inventory, Pricing, Shelf Rule
- ✓ Selling, Deposit, Spiff, Restriction Rule
- ✓ Vendor Item, Flavor, Variety, Manufacturer, Syndicated data, POS Identity
- ✓ Flexible Hierarchy

Organization

- ✓ Store, Warehouse, DC, e-Commerce
- ✓ Market Areas, Trading Areas, Touch points
- ✓ Inventory Location, Selling Location
- ✓ Syndicated Data
- ✓ Flexible Hierarchy

Vendor

- ✓ Appointment, Contract
- ✓ Factor, Rating, Deal, Discrepancy Rule
- ✓ Vendor Item, Assignment to Business Unit

Location / Geography

- ✓ Syndicated Data
- ✓ Flexible Hierarchy
- ✓ Related Address

Employee

- ✓ Flexible Roles, Schedules & Tasks
- ✓ Splits, Commissions & Spiffs

Customer

- ✓ Affiliation
- ✓ Prospect
- ✓ B2B & B2C
- ✓ Syndicated Data

Time

- ✓ Time
- ✓ Types of Calendar, Transformation
- ✓ Flexible

Base Data Model – Third Normal Form

<p>POS System (ARTS 5.0 Compliant)</p> <ul style="list-style-type: none">✓ Control: Internal Transfer, Security✓ Retail : Sale Return, No Purchase, Tender, Till✓ Store Financial: Tender Deposit/Loan/Pickup✓ Transfer, Receipts✓ Reference to Customer Order	<p>Order Management)</p> <ul style="list-style-type: none">✓ B2C & B2B: Reference to POS✓ Back Office State:<ul style="list-style-type: none">✓ AB³C: Fulfillment, Shipping, Partial Shipment, Delivery✓ Front Office State:<ul style="list-style-type: none">✓ Create, Add/Change/Delete✓ Pickup, Partial Pickup, Return, Layaway	<p>Inventory</p> <ul style="list-style-type: none">✓ Receipts, Requisition, Transfer, Return✓ Inventory State<ul style="list-style-type: none">✓ On Hand, On Order, On Layaway✓ Damaged, To Be Returned✓ Shrinkage
<p>Merchandising & Category Mgmt</p> <ul style="list-style-type: none">✓ Movements, Space Allocation, Shrinkage✓ Syndicated Data, Clustering✓ Mark Up/Down, Clearance	<p>Events & Promotions</p> <ul style="list-style-type: none">✓ Events, Campaign, Media, Launch✓ Creatives, Message, Depiction, & Rendering	<p>Planning & Budgeting</p> <ul style="list-style-type: none">✓ Merchandise & Category Sales Plan✓ Stores Sales Plan✓ Promotions Sales Plan, Budget✓ Marketing Budget

Aggregate Data Model (Dimensional for OLAP)

Retail Sale, Return, Tender, Markdown, Till

- ✓ Day/Week @
- ✓ Item/Subclass/Dept
- ✓ Employee/Touch Points
- ✓ Override, Discount
- ✓ Time Series
- ✓ Flow Analysis
- ✓ POS, Tender

Inventory Position

- ✓ Day/Week @, Item/Subclass/Dept
- ✓ .Out-of-stock, Zero Selling
- ✓ Forecast
- ✓ Time Series

Merchandising Category

- ✓ Scorecard
- ✓ Items, Employee, Customer, Frequent Shopper
- ✓ What-if
- ✓ Forecast & Time Series

Actual vs. Plan

- ✓ Forecast & Time Series
- ✓ Merchandise & Category
- ✓ Stores Sales Plan
- ✓ Promotions

Customer Order

- ✓ Day/Week @ Item / Subclass / Dept
- ✓ Employee / Touch Points

Events & Promotions

- ✓ Actual vs. Plan vs. Updated Plan
- ✓ Contribution:
- ✓ Campaign, Media
- ✓ Message, Rendering
- ✓ Forecast & Time Series
- ✓ RFMP, Migration

Derived Data Model (Data Mining)

Retail Sale, Return, Tender, Markdown, Till

- ✓ Day/Week @
- ✓ Item/Subclass/Dept
- ✓ Employee/Touch Points
- ✓ Override, Discount
- ✓ Time Series
- ✓ Flow Analysis
- ✓ POS, Tender

Inventory Position

- ✓ Day/Week @,
Item/Subclass/Dept
- ✓ .Out-of-stock, Zero Selling
- ✓ Forecast
- ✓ Time Series

Merchandising Category

- ✓ Scorecard
- ✓ Items, Employee ,
Customer, Frequent Shopper
- ✓ What-if
- ✓ Forecast & Time Series

Actual vs. Plan

- ✓ Forecast & Time Series
- ✓ Merchandise & Category
- ✓ Stores Sales Plan
- ✓ Promotions

Customer Order

- ✓ Day/Week @ Item /
Subclass / Dept
- ✓ Employee / Touch Points

Events & Promotions

- ✓ Actual vs. Plan vs. Updated
Plan
- ✓ Contribution:
- ✓ Campaign, Media
- ✓ Message, Rendering
- ✓ Forecast & Time Series
- ✓ RFMP, Migration

Data Warehouse Features of Oracle

- RBIA uses the features of Oracle Database that help to optimize Data Warehouses:
 - Partitioning (exchange partition for loading data)
 - Compression
 - Materialized views for SQL re-write
 - External Tables
 - Bit mapped indexes
 - Statistical Package , Ranking, Lag/Lead

Pre-built Advanced Analytics

Mining Model

Clustering Algorithm

- ✓ Item basket
- ✓ Associate basket
- ✓ Customer bundle
- ✓ Frequent shopper
- ✓ customer bundle

Classification / ABN

- ✓ Store loss
- ✓ Associate loss
- ✓ Item POS loss
- ✓ Associate Sales

Decision Tree

- ✓ Price Elasticity
- ✓ Customer Price
- ✓ Elasticity

OLAP Model

Times Series

- ✓ POS Flow Analysis
- ✓ In-store Sales
- ✓ Tender & Till

Forecasting

- ✓ Out-of-Stock
- ✓ Store Compensation
- ✓ Promotion Analysis
- ✓ Cost & Contribution
- ✓ Sales & Margin

What If

- ✓ Loss prevention
- ✓ Transaction Analysis
- ✓ Shrink Analysis
- ✓ Customer Value
- ✓ Frequent Shopper
- ✓ Customer RFM

Ten Business Areas

Store Operations

Point-of-Sale (POS)

Loss Prevention

Merchandising

Inventory

Workforce Management

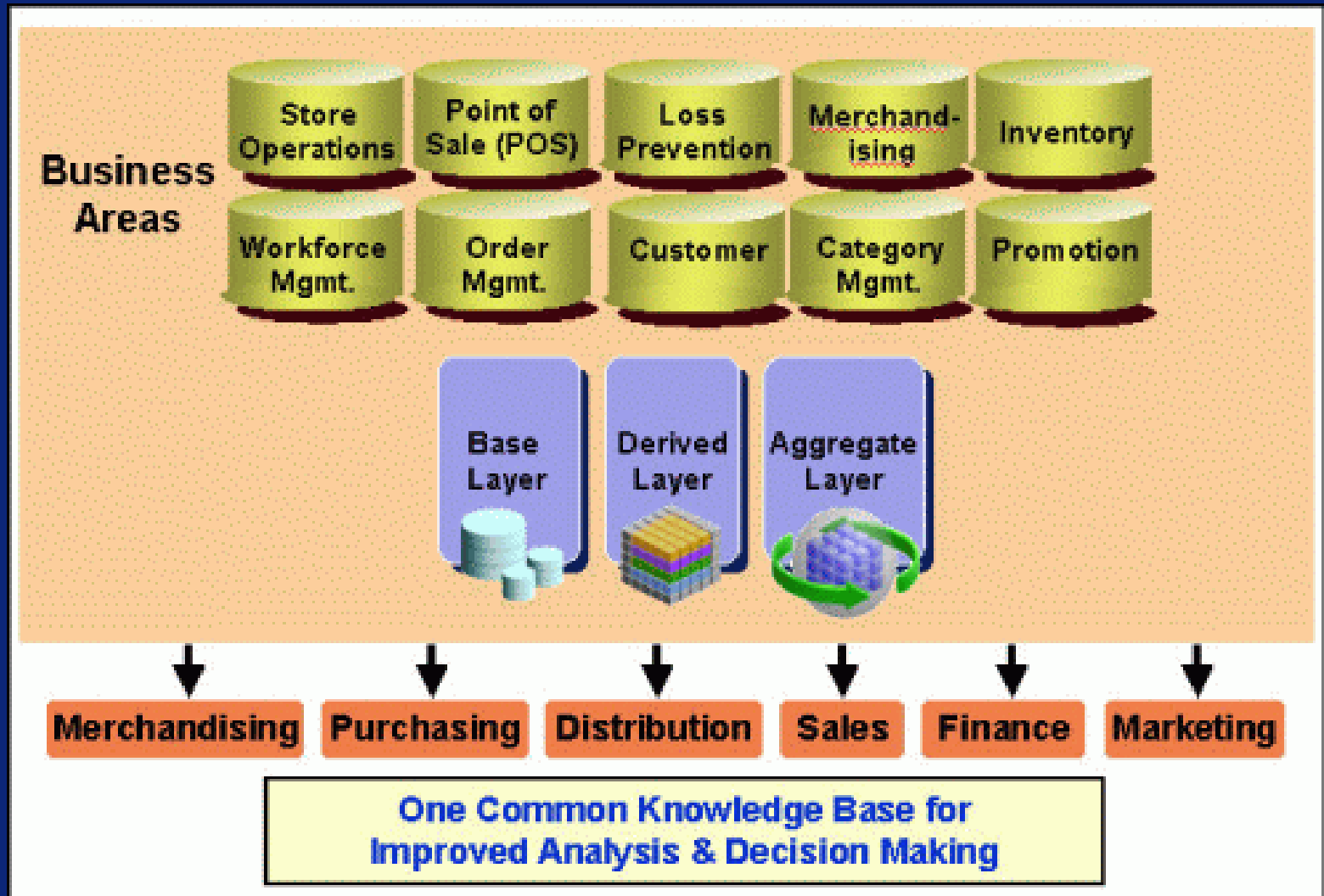
Order Management

Customer

Category Management

Promotion

Retail Business Area



Business Areas (1/5)

Store Operations

- Store Performance
 - Sales & Margin
 - Department & Item
 - Shopper Conversion
- Location Scorecard
 - Sales & Inventory locations
 - POS Department
- Employee Compensation
 - Commissions & Spiffs
 - Splits

Point-of-Sale (POS)

- Channel Transaction Analysis
 - Measures / Time
 - Visits / Sales
- Transaction level data (NOT summarized only)
- POS Flow:
 - Transactions, Items Value
- Transaction Value
 - Associate
 - Tender
- Time of Day
 - Store
 - Associate

Business Areas (2/5)

Loss Prevention

- Over / Short
 - Store & Shift
 - Cashier & Register
- Returns, Overrides, & Discounts
 - Store
 - Associate
 - Customer
- Prescriptive Analytic
 - Employee & Customer (“sweetheart”)
 - Associate & Store
 - Shift, Register
 - Tender

Merchandising

- Traditional Merchandising “bible”
 - Comp Sales Store and Department
- Movement Analysis
 - Fast moving
 - Slow moving
- Scorecards:
 - Inventory – Sales, Turns, & Margin
 - Markdown – Clearance and Promotional
 - GMROS & GMROI

Business Areas (3/5)

Inventory

- Sales Anomalies
 - Out-of-Stock
 - Zero Selling Occurrences
- Scorecards
 - Supplier
 - Product
- Shrinkage Patterns
 - Item
 - Associate

Workforce Management

- Workforce
 - Schedule: Plan vs. Actual
 - Performance: Cashier, Sales Associate
 - Sales Measures: AUS, AVS, UPT
- Employee
 - Roles vs. Reported
 - Flexibility
- Prescriptive Analytic
 - Employee Deployment Rules

Business Areas (4/5)

Order Management

- Customer Order Tracking
 - Fulfillment
 - Cancellations
 - Backorders
- Fulfillment Performance
 - Orders
 - Customers
 - Aging
- Channel Volume
 - Call Center
 - Internet

Customer

- Customer Segmentation
 - Segment Formation
 - Segment Migration
 - RFMP Analysis
- Basket Analysis (Product Mix)
 - Frequent Shopper
 - Anonymous Customer
 - Profitability
- Customer Profile Trends
 - Transition
 - B2B & B2C
 - List Performance

Business Areas (5/5)

Category Management

- Performance
 - Top/Bottom Sales
 - Product Cluster
 - Contribution
- Competitor
 - Item
 - Syndicated Data
- What If
 - Item price elasticity
 - Clustering

Promotion

- Performance – sales and margin
 - Plan vs. actual
 - Lift
- Promotion Comparison
 - Campaign & Media
 - Communication & Media
 - Channel
- Contribution by Event
 - Time Series
 - Causal
 - Halo

Out-of-Box Data Model Cater to These

Profile Trends

- ✓Transition
- ✓B2B & B2C
- ✓List Performance

Prescriptive Analytic

- ✓Employee & Customer (“sweetheart”)
- ✓Associate & Store, Tender Shift, Register

Contribution by Event

- ✓Time Series
- ✓Causal
- ✓Halo

Shrinkage Patterns

- ✓Item
- ✓Associate

Channel Transaction Analysis

- ✓Measures / Time
- ✓Visit / Sales

Employee Compensation

- ✓Commissions & Spiffs
- ✓Splits

Scorecards

- ✓Inventory Turns
- ✓Markdown Clearance
- ✓GMROS & GMROI

What-if

- ✓Item Price Elasticity
- ✓Clustering

Customer Order Tracking

- ✓Fulfillment
- ✓Cancellations
- ✓Backorders

Screenshots and Demos



www.dilbert.com scottadams@aol.com

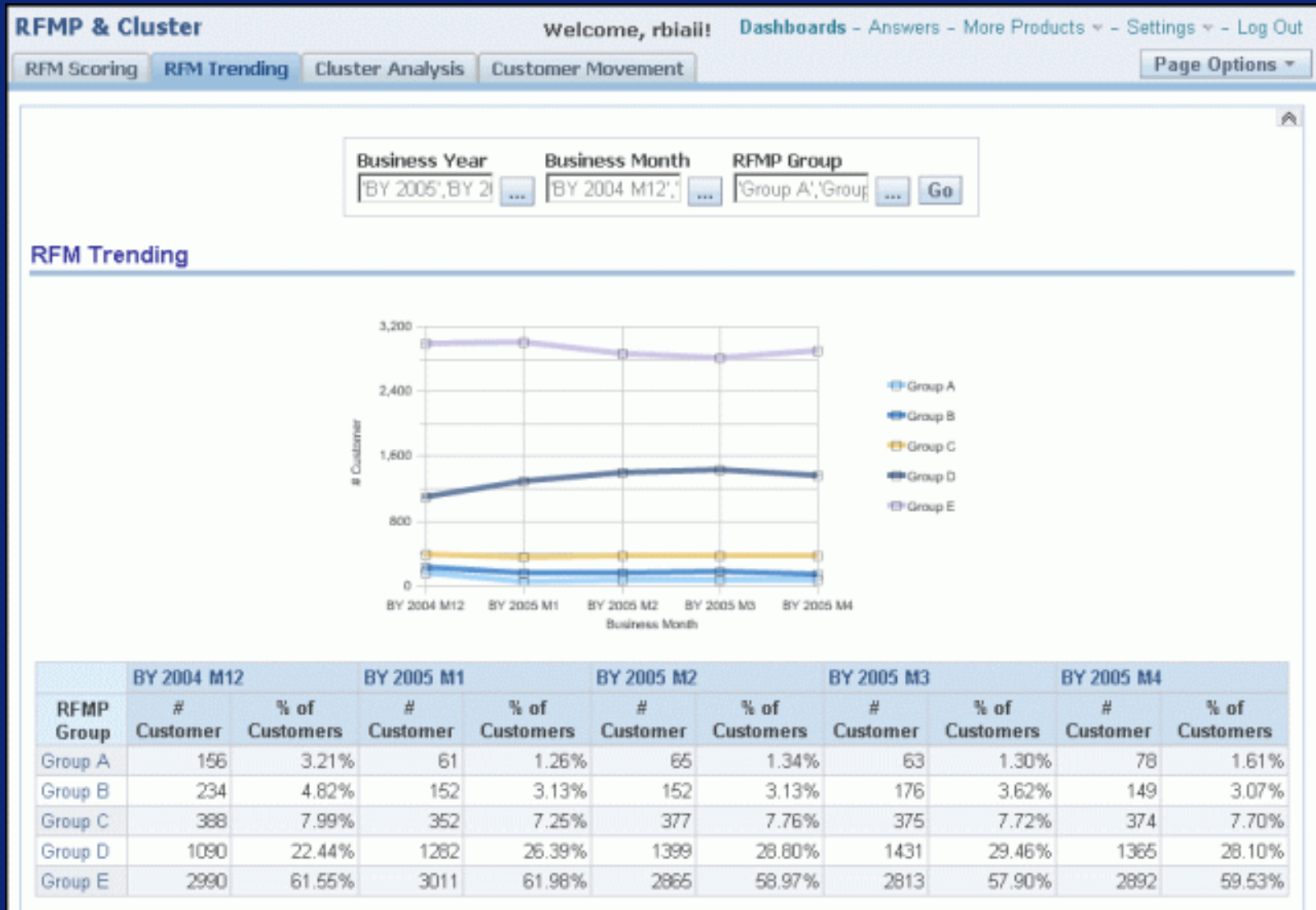


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RBIA - OBIEE Screens



Questions



- Contact info:
FSnowden@Deloitte.com
SNath@Deloitte.com

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